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How to Operate a Non-Profit Organization Effectively: Principles of Cost-Benefit Analysis

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HOW TO OPERATE A NON-PROFIT ORGANIZATION EFFECTIVELY: PRINCIPLES OF COST-BENEFIT ANALYSIS

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I am afraid I have to disappoint you because I certainly will not be able to tell you how to operate a non-profit organization effectively. Rather, I am going to tell you how not to do so, because what cost-benefit analysis is about is to run an organization in such a way that social benefits will be maximized. So if you follow the principles laid down in cost-benefit analysis, it will certainly lead you into conflict with the State organization which is working hard to make you minimize your costs, and not to maximize the social benefits your organization is supposed to maximize. So therefore do not take the title seriously. Rather, what I want to do is to give you some ideas of what cost-benefit analysis is about, because I have found that it is a management tool that is being applied more and more generally, but it is very rarely being understood.

You will find many incompetent cost-benefit analyses, and it may be that what you can profit from in this is to find out how to ask the right questions to somebody who is going to prepare a cost-benefit analysis on library systems, and how to find out whether or not he is incompetent in doing his analysis. Of course I can only give some sketches, and my main purpose is to give you some ideas of the philosophy behind this tool. What the tool really is, is an application of a certain field of economic theory which is called "welfare theory". This field as such is not very popular in economics, so there are not many economists who can competently handle this field of applied wealth economics. What I plan to do is to give you some of the basic ideas behind it, and to apply them to two examples, just to see in what spirit you have to handle this tool, or how you have to tell somebody how to handle this tool.

In order to give you some of the ideas, let me start not with a non-profit organization, but with a normal business, say a bookstore. Now if you run a bookstore, you probably have an objective and the objective will be to maximize profits. Now, what is a profit? If you have a profit, it is the difference between two items. One of the items is your sales, that is the turnover, or the number of books you have sold, multiplied by their retail prices. So that is the entry on the "plus" side. On the other hand you have the cost. The cost is your outlay for purchasing books at their wholesale prices, plus the costs of operating your shop. What you then do is subtract one from the other. You say, "let me take my gross entry and subtract from it my costs," and that gives you your net profit. If you find that your net profit is sufficient, you have a reasonable profit.

You are satisfied for different reasons. First of all, you see that you have obviously run your shop efficiently, because you were able to meet the costs that are necessary to run a shop. So you could not have wasted money very much, otherwise you would not have a profit left over. The second thing is, you can be sure just by having the profit that you obviously did offer a certain supply of different titles so that when people came into your shop to buy certain books they found at least some of the books that they wanted to buy. So that means that the supply that you offered was not completely inadequate, otherwise you could not have sold the books. And the third thing is that the costs of managing the store can be met by the demand for books. So there is an economic reason to run a bookstore.

This sounds very trivial and simple, but it is not at all! You have to ask yourself, "Why do we accept profits (and you know that some do not any more) as a guideline for running businesses?" In university libraries we cannot do this, but I will come to this later.

But normally if we take a bookstore or any commercial business, why do we accept in principle the difference between what you earn grossly and what you spend on costs as a guideline? The reason is, in terms of welfare economics, that the price signals something, and the costs signals something else. The price is a signal for a certain social benefit. That is the philosophy behind this. Because if somebody is willing to pay a price, he is willing to sacrifice some money, and that means he cannot spend his money on something else. So by the fact that he is willing to spend, say 10 or 20 dollars on a book, he proves that the book is worth something to him. He is forgoing the opportunity to buy something else, for instance, a pair of shoes. He will not buy them, he will buy the book instead. So this means that this book must have something that will increase his welfare, otherwise he would not be willing to pay a price for it. And if he is willing to pay a high price, then the contribution to his welfare must be high. And if he is only willing to pay a low price, it must be low. Therefore, prices are accepted as a measure of the contribution to the welfare of the people who are paying these prices. Speaking more generally, the willingness to pay prices is taken as a guideline for the social benefits that are generated by a certain commodity or service. So you can value these commodities or services by the prices which they command on the market. Therefore you can evaluate physical things like books and shoes by their market prices. So there is a philosophy behind all of this. Prices as a measure of social benefits, or willingness to pay as a measure of social benefits.

Coming to the costs, if you hire somebody in order to run your shop, somebody else cannot hire the same person. Now, that same person could have worked elsewhere, and he could have produced something that would have been sold. He would have generated benefits. And these benefits are lost to the economy, because you hire this guy. The fact that you are able to hire this guy shows that you also are able to produce something that generates benefits, social values. On the other hand, you have to compare the benefits forgone, the lost opportunities for the economy that would have been avoided if somebody else had hired your staff. You have to weigh this against the benefits that you yourself are creating. If you are able to do so, you get a profit. This means that you are generating enough social benefits to justify your hiring of personnel, renting of a store, etc. So in other words, what we normally have in a business with sales on the one hand and costs on the other hand, are measures for social benefits and social losses. Now, the only thing that we have to do is to apply the same things to occasions when there is no market.

Why is there no market? Let me give you a simple example. If you take a street, and the heavy traffic on the street is generating noise, then there is a certain kind of cost. This is the cost of the gasoline, the cost of the car engines and so on. But there is another kind of cost which we call social cost. That is the noise for instance. There are people who are living on that street who are being disturbed! These are social costs because they are reducing their well-being. Now, we are accustomed to accept as costs only that which is paid in money, but that is wrong. If you just think back to the philosophy behind the market which I just tried to lay down. We have said that cost is everything which subtracts from social benefits and social well-being. And of course noise is such an item. Yet you have not to pay those costs. So if an entrepreneur has the idea of selling devices that would reduce the noise level he would be unable to sell those devices because the motorists do not have to pay part of the social cost in the first place. So you cannot take the profits made on anti-noise devices as a measure of social welfare, social gains and losses. That is why we have so many attacks on profits and the like these days.

You have to loosen the connection between the commercial entries in a business' books and social profit and loss. Rather, you have to see what is behind them - what are the social gains stemming from a certain activity, and what are the social losses stemming from that same activity? You must compare these latter two. In other words, if you want to find out if a certain economic activity is justified, you have to compare social gains, which we call benefits, with social costs, which we call costs. What you do then is a cost-benefit analysis. So the idea of cost-benefit analysis is trying to do the same thing that is implicit in the market in fields where there are no markets. And yet there are still some limitations.

One limitation comes out immediately if I come back to the example of the street with the noise. Normally you would say, "I measure the social cost of the noise by just trying to find out the willingness to pay by those who are hit by the noise in order that the noise disappears." So you would have to go and ask people, "How much would you be willing to pay?" This would be a measure for the one who is trying to sell anti-noise devices. He would be presented with a figure, and this figure would tell him, "I cannot sell my anti-noise device on the market, but I can sell it to the State because the willingness to pay to avoid the noise is of a certain level." It may be that the willingness of the people affected by the problem was only so high due to their being poor. In this case, you are not willing to accept willingness to pay as a guideline to determine whether noise levels should be reduced or not because your opinion is that the absence of noise is not a social good that should be distributed on the basis of income. This same principle applies to clean air.

So the willingness to pay, which is difficult enough in itself to determine, can no longer be accepted as a guideline. You have to blow it up somewhat. You have to say, "Suppose this population were of normal income." You have to inflate the figures to get the benefits of installing anti-noise devices. This inflated figure gives you the socially warranted benefits.

Now the same thing would apply to a library problem. If you are to evaluate the time students spend waiting in a line before they can borrow your books, you would say, "What would the students be willing to pay in order to get their books faster?" Then you might say, "We cannot do this here because students are poor." But the education of the students has a certain social value; in fact, the State is spending millions to finance education. You have to evaluate the waiting time not just by the figure you would get from how much the students would be willing to pay, but you have to take what the State would be willing implicitly to pay. Considering the millions and millions of dollars that the government is putting into education, you would find out that you have to evaluate the waiting time much higher than if you were only to consider the figure of how much the students would be willing to pay.

I am sorry I have to introduce the complications before I have fully explained what the whole thing is about, but I think one of the things one should be aware of is the fact that adequate cost-benefit analysis is a complicated thing, and you have to have in mind many things. Otherwise you get cost-benefit analyses that are worthless. They will be a wrong guideline. You will get cost-benefit analyses that will yield policy recommendations that are false. You always have to have in your mind, "Why do we do the whole thing?" The principle would be that you would evaluate the social gain of any operation, which of course applies immediately to library operations. What you try to get at is the benefits on the one hand and the costs on the other hand. Now, passing over much technical detail, I can move on immediately to some examples, namely library problems.

Now as Dr. Wehefritz has already told you, I am not a library expert and I do not know much about library problems. Yet, I can imagine that some of the problems are very similar to the problems we have to handle normally in cost-benefit analysis. I have written down a little "catalogue", which from your point of view might be unprofessional, but which contains some points that you might want to look at.

One such item that I would like to use as an example would be the availability of many titles. If you run a library, you have a choice to make. The choice comes from your tight budget, so you cannot buy everything. You have to choose. You might choose rare books - books which are almost never in demand. Maybe you are spending a lot of money on books that will absolutely never be asked for. The question is, "What is the benefit of this compared with alternative uses of the same money?" Given that your budget is tight, every dollar that you spend on buying one rare book is lost for buying, say, a standard textbook. You have to compare two sorts of benefits. This shows how delicate the analysis really has to be. First you take the benefits of your decision to buy rare books that are maybe never in demand. This you have to compare with the benefits that are forgone if you buy those rare books. These latter benefits are the so called opportunity costs, namely, the costs that result when students have to wait longer for a limited

number of standard textbooks. You might need thirty textbooks, but you only buy twenty so that you can buy two rare books.

In order to make these analyses not only by intuition, but in view of real economics, you would have to weigh two very different kinds of benefits. I would like to give from the standpoint of a librarian.

I want to say first a few words about the costs of purchase. It has been very popular in cost-benefit analysis to say that the complicated part is to value benefits, since they are of a non-monetary nature and you have to somehow find monetary figures for things that cannot really be evaluated in these terms. Waiting times would be of this nature. According to this line of thinking, costs are very simply what you pay in dollars. You buy the book, and it costs you so many dollars. This is not true! The point is: given your budget is tight, you cannot realize all projects that would be justified from an economic point of view. Normal cost-benefit analysis defines a certain "cost-benefit ratio". You put in the nominator the benefit, and in the denominator you put the costs. If this equation is above 1, there is a social profit. The benefits are higher than the costs. And yet it turns out that, given the tight budget, you cannot realize every project that has a cost-benefit ratio larger than 1.

Unlike private business, you cannot realize every project which would generate social profits because your budget is tight. You get your budget from the government, and it is always tight. If you construct a list, and you would have to order the list according to cost-benefit ratios, or the net social benefits generated by those projects, you would normally have to find a certain cut-off ratio. This might be 1.38, which would mean that you cannot realize anything which is below 1.38. The consequence in this case is that you are not able to realize all the projects which would be socially desirable, even from an economic point of view. You have to cut off at an earlier point. This means that every dollar you spend on a rare book is not $1.00, but in this case $1.38. This is because you are not spending this dollar on a textbook. The cost-benefit analysis for a textbook would generate a cost-benefit ratio which would exceed 1. You cannot simply use monetary costs, but you have to use opportunity costs. These opportunity costs might be more than the dollars you are actually spending on the book. The alternatives or opportunities forgone by spending a dollar on a rare book should not be represented by the amount $1.00, but by the amount $1.38.

On the other hand, let us take the benefits of buying rare books. In normal cost-benefit analysis you would say, "Here is a certain book. We have held it for 100 years and it has never been used. It has not been worth buying." In this conception, every dollar your library spent on buying that book was lost. This is not correct!

A very important benefit one must consider in evaluating libraries is the opportunity of having <u>available</u> books. In other words, there is a rather high probability that a researcher who has a bibliography can enter your library, look up a reference in your catalogue, and the book will be there. This is like an insurance policy. There is a <u>positive net value</u>. You must try to evaluate this factor. It is difficult, but you must not forget to do it. You cannot simply say, "I obtained the value of the benefit of a certain project by multiplying the number of uses by the value of each use." You have to say, "There is a certain value of the availability of many titles." This value is positive, and you have to put it into the calculation.

Here I can refer back to the title of my talk, "How to run a non-profit organization effectively." State organizations look at your spending data and they say, "Look, you should tighten your budget and you should not spend so much money." In this case what you need is arguments of an <u>economic</u> nature. Normally the State would confront you with dollar data. Someone from the State would say to you, "Look, your library costs us X million dollars per year." You are unable to confront those people with dollar figures. If you can say, "Look, it costs $50 million, but what I earn socially is $70 million. You cannot afford to tighten my budget", you might obtain your desired budget. The lack of cost-benefit analysis in your sector is a handicap if you come to bargain with the government about the size of your budget.

I have considered one type of benefit - the sheer availability of a variety of titles, even if they are not all used. The second benefit that I would want to put into an analysis of this type is time. In this case it would very often be the researcher's time that is lost if he asks for a certain title and it is not there. In this case you could say, "What I need is the postage and the manpower to ask other libraries if they have this particular title." But this is only a small part of the real story. In fact, the researcher's time is being lost, and you have to evaluate the social value of this loss. This is complicated, and difficult; it may even be impossible, but it is an important item. You must put it on your list and try to obtain data for it. The normal way to do this would be through a probability distribution of how such cases are distributed over time and over users. An evaluation of this distribution would yield an estimate of the benefits lost, or the benefits which would be gained if you in fact decide to buy a certain book.

This is a very abstract type of thing, and as you are aware, these cost-benefit analyses are of a highly complicated nature. What you need is competent people. These people must also have ideas, since ideas are necessary to arrive at these benefits which by nature are very diffuse. Yet I think it is essential for your business, since you are coming into tougher and tougher budget discussions. If you also consider your budget in the context of the budget of your entire university, as I am doing at the University of Dortmund, you can see the opportunity costs for the university. For instance, the university could hire so many professors and teaching assistants. The University then has to weigh the benefits which could be gained by hiring teaching personnel against the benefits to be gained by running the library. Typically, people like Dr. Wehefritz in Dortmund are unable to present monetary figures which would say, "Look, these are the values I am generating here in this library. If you give me a very tight budget, my cut-off ratio will be 1.7, and you cannot do this!" This is a different kind of argument. It is an economic argument, and an argument which can be interchanged with the kind of arguments that normally are used to determine the distribution of the university budget.

Finally, let me consider the evaluation of time itself. Suppose that you are considering how long to keep your library open, or whether or not to keep the library open on weekends. In my travels in the United States I have seen that university libraries are frequently open until midnight, and they are open every weekend, whereas in Germany this is not so common. In a cost-benefit analysis you would have to weigh the additional cost of keeping the library open for extra time. This additional cost would come out of your library's general budget, so it could have high opportunity costs. But on the other hand, you would have to consider that there already is a high capital investment in your library, and the time for which it is available to students relates to the efficient use of this capital investment. You can evaluate the total benefits by putting a value on the time of researchers and students who may want to use the facilities over the weekend. As I previously mentioned, you cannot use willingness to pay as the only yardstick, but you have to consider the social value which is being placed on the students' and researchers' time by the State. This would give you the real figures for these benefits.

This enables you to go into budget negotiations with monetary terms. The people who make your budget decisions would know what it costs not to give you X amount of staff. You can show that the cut-off ratio gets higher and higher as your staff gets smaller and smaller.

One last little point. You will very often come into conflict with the State itself because the agency that we in Germany call the "Rechnungshof" (Audit Office), which comes every year to look into your expenditure files, says things such as "Look, you should have used pencils instead of pens on this project. You would have saved 10 pfenning on each pen." These people work very hard on things like this, with the effect of making a considerable negative contribution to social welfare. Let me just at the end bring in a little example.

Suppose that you are confronted with two options, one which we call Option A and the other Option B. Now, suppose that you have done all the work on a cost-benefit analysis. Say that the benefits of Option A are 100 in monetary terms. If the costs are 80, then the net social gain is 20. On the other hand, Option B would yield benefits of 120, but with a

cost of 85. In this case the net social gain is 35. With Option B you get an additional 15 units of net social benefits by adding 5 units to the costs. Obviously, Option B is a project which is socially highly desirable compared to Option A. Yet the State will come and say, "Listen, Option B costs 5 units more than Option A. "You cannot do this! You are wasting the taxpayers' money." You will say, "But look, Option B is so much nicer", but the State will say "Everyone in town is telling us that what he is doing is nicer". So in order to realize the socially desirable project, you have to have those figures! Otherwise, you are always in the situation where worthy projects cannot be realized. For hundreds of years, governments have looked only at the cost figure, since they want to minimize the budget. They do not want to maximize net social welfare contribution. That is the problem.

Coming back to the title of my presentation once again, you must realize that even when you undergo a cost-benefit analysis you come into conflict with the thinking of the State. But if you develop this tool to a level where it really can be used, you would be able in a budget distribution situation to say "Look, Option B gives us a social benefit of 35 compared to a social benefit of Option A for the cost of only 5". There is nothing the State can really say against this argumentation.

DISCUSSION

Mr. R.F. Eatwell: Professor Bonus, we're all faced with arguing with other departments for money. I'm faced with, at the moment, an offer of more money for inter-library loans which is cheaper for providing a service than buying books. So ultimately, we could become a referral service; which is not right.

I quite agree with your point that it's the potential use of a library that's extremely valuable and can't be costed. What I'd like to ask you is: can academic departments do the same sort of thing? Can they prove what they're giving to the university and the country as a whole in the same way that the library can? For you see, they're producing two things. First, students, whom you can perhaps cost as a benefit in the end, although some students can't produce any benefit because they can't get any jobs; and second, the research that goes on. Can you cost that?

Bonus: Of course you can't.

The problem is really the following. Let me use the University of Chicago as an example. There was a market for students of the University of Chicago, and they were going strong. The university had every incentive to provide courses that would be valued by the market. No cost-benefit analysis was necessary. The departments of the University were eagerly putting money into the library because they had learned that if there were no books, they couldn't produce students that would be accepted by the market.

The core of our (German) problem is that our universities are run by the State and we're producing students whom no one can say are socially valuable. Actually, we are producing far too many students. Nobody knows where to put these students! Your point is well taken.

In fact, our advantage at the moment is a strategic, rather than economic one. The departments are able to argue, "We need X amount of personnel, otherwise we can't put through our students. And you, politicians, if we can't put through our students, you will get into political trouble. Therefore, provide X amount of funding". And the State is doing it.

The real problem is that we don't have the market for students from the State universities anymore. At the same time we don't have cost-benefit analysis. We don't have anything.

The point is: one should try to apply the tool of cost-benefit analysis more widely instead of dropping it altogether.

Mr. A.C. Bubb: At some point, we are bound to cost in financial terms, for example, the frustration of a member of an academic staff who cannot find a book on our shelves. How can this really be done except by a sort of informed guesswork? Is there any real, logical, scientific way of turning that frustration into so many Deutsche Marks or Dollars?

Bonus: There's literature on this. Devices have been created that somehow give some approximations on this.

In the very common case of a proposed airport, it's very difficult to evaluate the frustration of the people who live nearby who would get the noise of the planes. Yet, there are some possibilities for getting at some kind of "size of order." You need to know if the problem is worth $1.000.000 or only $1000. If you are comparing $1.000.000 to $2.000.000, the effect is the same, but you have to have a general idea. You have to try to evaluate the cost, end see if this cost would be accepted.

Mrs. L.-K. Uuttu: Professor Bonus, we're up against a problem with cost-benefit analysis. I think you've given us a very good idea of what cost-benefit analysis is, but I have real problems presenting, if I may say so, an "account" of a cost-benefit analysis because the

benefits are an arguable quantity. It seems to lead us back to the same type of horse trading as before. Can you give us some indication as to how arrive at a good evaluation of these benefits?

Bonus: This is a very important point. This field was developed in the 1950's in the United States to evaluate water projects - dams, etc. This was done because the State agencies needed some figures in order to be able to choose among the variety of possible projects. They wanted to determine these things when there was no market for these things. The point was that the government itself did those analyses, and therefore they believed them, and they acted according to them. But here I suppose the government is not too eager to encourage you to do these analyses. Therefore, if you present them with results they will try to argue.

You have to come to a state.... which will not come in a mere matter of months.... when you develop the instrument of cost-benefit analysis so that it's well established and accepted by the literature within the field of library services. Once this is so, then there will be X number of papers on this topic. Then an established opinion will come, and you can quote Mr. so-and-so and all that he has proven. You can show that this way of deriving benefits is the true one. Then the agency will come under pressure.

Mr. J. Ross: My question is about the way that these various projects are compared. If you want a project that takes 80% of your budget, it does'n't matter what the benefit ratio is, you can't have it. If it's 40 or 50% of your budget you might be allowed it. And then at the end of the year, if 10% of your budget is spent, you're told to go and spend money on lots of little projects even if there isn't any benefit at all. Is it really different in Germany?

Bonus: It happens in every department everywhere.

In fact, you are punished if you save money. If you are acting rationally, that is, running a library effectively, you are trying to keep expenditures down. But if you do so, you find that in the following year your budget has been cut.

It's a bad thing that the funds which have been provided cannot be taken over into the next year.